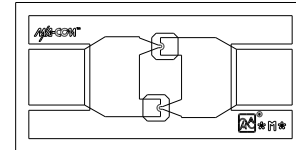


Features

- Low Series Resistance
- Low Capacitance
- High Cutoff Frequency
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Designed for Easy Circuit Insertion
- Can be Mounted with Solder or Conductive Epoxy



MADS-001318-1451

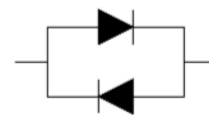
Applications

- ISM

Description

The MADS-001318-1451 anti-parallel pair is a gallium arsenide flip chip Schottky barrier diode. This device is fabricated on OMCVD epitaxial material using a process designed for high device uniformity and extremely low parasitics. This diode is fully passivated with silicon nitride and has an additional layer of polyimide for scratch protection. The protective coating prevents damage to the junction during automated or manual handling. The flip chip configuration is suitable for pick and place insertion. This device can be attached with solder or conductive epoxy. The high cutoff frequency of this diode allows use through millimeter wave frequencies.

Typical applications include single and double balanced mixers in PCN transceivers and radios, police radar detectors, and automotive radar detectors. The devices can be used through 80 GHz. The MA4E1318 anti-parallel pair is designed for use in sub harmonically pumped mixers. Close matching of the diode characteristics results in high LO suppression at the RF input.



Ordering Information

Part Number	Package
MADS-001318-1451AG	100 piece gel pack
MADS-001318-1451AP	3000 piece tape and reel

Electrical Specifications @ +25°C

Parameters	Test Conditions	Units	Min.	Typ.	Max.
Junction Capacitance (C_J)	0 V, 1 MHz	pF	—	0.025	—
Total Capacitance (C_T) ¹	0 V, 1 MHz ¹	pF	0.030 ²	0.050 ²	0.065 ²
Slope Resistance (R_d)	9.5 - 10.5 mA	Ω	—	4	7
Forward Voltage (V_{F1})	1 mA	V	0.60	0.70	0.80
Forward Voltage Difference (DV_F)	1 mA	V	—	0.005	0.010

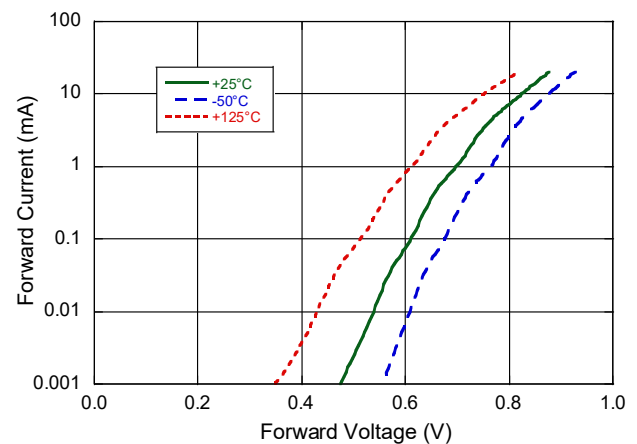
1. Total capacitance is equivalent to the sum of junction capacitance C_J and parasitic capacitance C_P .
2. Capacitance is per each Schottky diode.

Absolute Maximum Ratings^{3,4}

Parameter	Absolute Maximum
Incident LO Power	+20 dBm
Incident RF Power	+20 dBm
Operating Temperature	-65°C to +125°C
Storage Temperature	-65°C to +150°C
Electrostatic Discharge Classification	Class 0, HBM

3. Exceeding any one or combination of these limits may cause permanent damage to this device
4. MACOM does not recommend sustained operation near these survivability limits.

Forward Current vs. Temperature



Handling Procedures

The following precautions should be observed to avoid damaging these chips:

Cleanliness: The chips should be handled in a clean environment. Do not attempt to clean die after installation.

Static Sensitivity: Schottky barrier diodes are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.

General Handling: The protective polymer coating on the active areas of these die provides scratch protection, particularly for the metal air bridge which contacts the anode. Die can be handled with tweezers or vacuum pickups and are suitable for use with automatic pick-and-place equipment.

Mounting Techniques

Die attach for these devices is made simple through the use of surface mount die attach technology. This chip was designed to be inserted onto hard or soft substrates with the junction side down. This chip can be mounted with conductive epoxy or with solder.

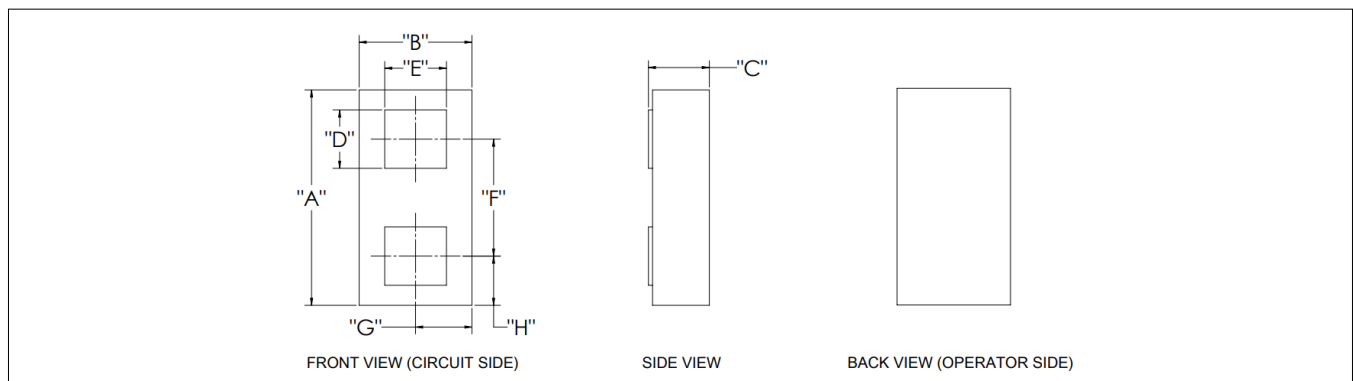
Solder Die Attach:

This device can be mounted with Sn63/Pb37 or RoHS compliant solder. Typical reflow profiles are provided on MACOM application note M538 "Surface Mounting Instructions" which can be found on the MACOM website.

Epoxy Die Attach:

This device can also be attached with conductive epoxy. The assembly can be preheated to 125 - 150°C. Use a minimum amount of epoxy. Cure epoxy as per manufacturer's instructions.

Outline Drawing⁵ (Case Style 1451)



Dimensions

Dim.	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	0.0302	0.0308	0.7680	0.7830
B	0.0157	0.0163	0.4000	0.4150
C	0.0083	0.0091	0.2100	0.2300
D	0.0077	0.0089	0.1950	0.2250
E	0.0082	0.0094	0.2080	0.2380
F	0.0164	0.0167	0.4170	0.4250
G	0.0080 typ.		0.2038 typ.	
H	0.0070 typ.		0.1773 typ.	

3 6. Pad finish is 0.2 microns of gold over 4 microns of nickel.

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.